



SCIENCE AND RESEARCH DIVISION

Nature and scope of activities

NSW DPI, through the Science and Research Division, undertakes the majority of public sector research and development in the state.

The division's role is to provide the science, research and innovative technologies to increase the international competitiveness and environmental sustainability of the state's primary industries and underpin biosecurity policy and implementation. In undertaking this role, we coordinate research investment across hundreds of projects, foster alliances and cooperative ventures, conduct testing for industry at nationally accredited laboratories and provide a strong evidence base for policy development.

The division comprises seven branches:

- Systems Research
- Production Research
- Health Sciences, Strategic Alliances and Evaluation
- Resources Research
- Rural Innovation
- Research Operations
- Science Strategy.

Major outcomes achieved

The Science and Research Division has performed strongly in attracting external funding with approximately half of its \$100 million direct investment being secured from external sources.

Central to our endeavours this year was the consolidation of climate change research to help primary industries reduce emissions while increasing productivity. Funding of \$2.5 million under the NSW Greenhouse Plan will bolster our research, with the additional money being injected into a range of research projects that span different industries and regions.

Primary industries competitiveness is increased

Coping with climate change (State Plan: P6, E3, E4)

Research to help primary producers adapt to climate change during 2006-07 included:

- identification within the sub-tropical dairy region of trends since 1957 in climatic variables related to dairy production, such as the start of summer moving from mid-November to mid-October, that have significant consequences for pasture production. Simulation modelling and statistical analyses were used to develop monthly rainfall and pasture growth probabilities for three seasonal forecasting systems, giving dairy producers a tool to assess seasonal risk in feed base management
- in collaboration with NSW Department of Environment and Climate Change, enhancement of the operational capacity of catchment management authorities in western NSW to monitor regional ground cover and forecast likely land degradation events by refining the current national AussieGRASS spatial growth simulation system
- the downscaling of global climate models in a geographic information system framework to get a better picture of the impact of climate change on specific NSW primary industries and regions
- development of new plant varieties for agriculture and forestry that cope better with changed climatic conditions, for example, drier conditions, shorter seasons and increased rainfall intensity
- formulation of a range of paper-based and computer packages to assist primary producers make better decisions in the face of climate variability
- investigation of the direct effect of increased atmospheric carbon dioxide on plant growth, for example, through the Hawkesbury Forest Project, which is examining the impact on plantation forests of the interaction between elevated atmospheric carbon dioxide and water availability.

Stockfeed testing service (State Plan: S8)

Farmers across the state are taking advantage of a new NSW DPI stockfeed testing service. Launched in 2006, the Feed

Quality Service measures crude protein, digestibility, fibre and, most importantly, the energy content in megajoules per kilogram of feed so farmers can determine how much to give stock for maintenance, production or reproduction. The service, which NSW DPI extension services are promoting, is proving particularly valuable to farmers who drought-feed stock.

Improving grape and wine quality (State Plan: P1, P6, E1, E4)

The NSW wine industry, which generates more than \$440 million annually in export income, is set to benefit from the new \$31 million Winegrowing Futures Program. This will see the National Wine and Grape Industry Centre in Wagga Wagga, a partnership between NSW DPI, Charles Sturt University and the NSW Wine Industry Association, progressing research and extension activities in the key wine grape growing regions of NSW. The program aims to improve grape and wine quality to match consumer preferences through improved management practices that provide healthier and more productive vines and create water and nutrient savings.

Plant and pasture breeding successes (State Plan: P1, P6, E1, E4)

New commercial lines developed for commercialisation by NSW DPI were:

- Mannus, a new oat variety for winter sowing
- wheat varieties Jaeger and EGA Eaglehawk – one for early and the other for main season sowing
- a new synthetic white clover cultivar, Grasslands Trophy, one of a suite of cultivars with potential to double the Australian white clover zone. The cultivar was produced in alliance with AgResearch NZ, Wrightson PGG and Meat and Livestock Australia
- Jandaroi, a new high yielding durum wheat variety with outstanding pasta making quality.

NSW DPI also helped to establish the National Pulse Breeding Program and the National Chickpea Improvement Program.

Appropriate access to natural resources

Greenhouse gas emissions (State Plan: P1, P6, E3, E4)

Research aimed at mitigating greenhouse gas emissions included:

- award-winning research at the NSW DPI Wollongbar Agricultural Institute. Trials have shown that sequestration of carbon in agricultural soils can increase crop yield significantly and reduce nitrous oxide emissions. The research, which is the subject of a case study in this chapter, is in collaboration with Gosford-based company BEST Energies
- development of forest carbon accounting procedures that better reflect the fate of timber products after harvest
- development of a system whereby catchment management authorities can act as carbon pool managers for landholders to facilitate their participation in the carbon trading market.

The system should give landholders cash income plus an incentive to revegetate their properties

- quantification of carbon sequestration in soils under different agricultural production systems
- research into the use of recycled organics in agriculture and forestry to supply nutrients and sequester carbon, a technique also applicable in mine site rehabilitation
- work on reducing methane emissions from ruminant livestock.



Climate control tree chambers used to investigate climate change impact on tree growth.

Releasing fish for the future (State Plan: S8, E4, E8)

NSW DPI research is helping to ensure that more fish are available in the future by quantifying the mortality of released line-caught fish and then developing and testing changes to fishing gear and practices designed to maximise survival. Given that between 30 and 50 per cent of the total recreational catch each year is released, the research will potentially have a major impact.

To date the findings relating to seven species show that hooking location and handling practices are among the most important predictors of mortality. Anglers are being advised of correct handling procedures and are responding positively to the suggested changes. The research, which will cost more than \$1.5 million, is funded by NSW DPI recreational fishing licence fees.

Communities and primary industries prepared for managing risks

Diagnostic services serve new purpose

(State Plan: S8, P1, P6, E4)

The research and diagnostic capabilities of NSW DPI laboratories allow us to provide a state-of-the-art service to clients and respond quickly to new threats. This year the rapid, high-throughput virus detection system originally established at Elizabeth Macarthur Agricultural Institute to meet the growing threat posed by avian influenza was adapted to meet other needs. It is now being used nationally for testing

imported prawn products for three virus diseases for the Australian Quarantine and Inspection Service.

QX-resistant oyster breeding program (State Plan: P6, E4)

NSW DPI's Sydney rock oyster-breeding program won a Bronze Award in the Business, Management and Financial Performance category of the 2006 NSW Premier's Public Sector Awards. The award recognises the program's significance in developing QX-resistant, fast growing oysters that have contributed to industry sustainability.

The selectively bred oysters have been commercialised now for two years in collaboration with the industry-based Select Oyster Company. Field trials have shown that the new 'super oyster' is on average over twice the weight of standard oysters while industry has praised its marketability.

Plant health (State Plan: P1, P6, E4)

In an effort to limit chemical use and improve market access, NSW DPI developed a number of new integrated pest management plans and evaluated biological control agents for the vegetable and grain industries. In tackling specific issues our plant health scientists:

- recommended an apple black spot management strategy for control of Alternaria leaf and fruit spot
- evaluated the insecticide resistance of a number of pests and developed new management plans so insecticides remained effective
- developed a DNA-based technique for identifying rice consumption by sediment-dwelling midge larvae, a pest of rice. The technique will aid understanding of the role of different midge species in rice ecosystems
- prepared diagnostic protocols for exotic diseases such as mal secco, a fungal disease of citrus.

Associated research aimed to re-open or establish market access for several Australian fruits in Taiwan, Japan and the USA.

A national approach to invasive animals (State Plan: S8, E4)

NSW DPI jointly funds a national project to manage invasive animals with the Invasive Animal Cooperative Research Centre, the National Land and Water Resources Audit, and Land and Water Australia. Project achievements to date include:

- facilitating national agreement on information and reporting priorities for invasive animals
- establishing national indicators to assess the effectiveness of management programs
- developing national monitoring protocols
- collecting state and national information on the extent, abundance and impacts invasive animals.

The project, which commenced in 2005, will next year deliver improved state and national information products, improve links with concurrent NSW programs, and guide development of a national invasive species information system.

Informed debate on primary industries involving extensive consultation

Climate change research priorities (State Plan: P1, P6, E3, E4)

In January 2007 NSW DPI prepared a discussion paper titled Climate Change Research Priorities for NSW Primary Industries for the Ministerial Advisory Council on Primary Industries Science. This is a high-level committee comprising representatives of industry and the research community. Senior scientists from NSW DPI subsequently spoke to the council on the causes of climate change, recent climate trends and projections, possible implications for NSW primary industries, current research and recommendations on future research directions.

The discussion paper, which we prepared in consultation with stakeholders, identifies 30 research priorities in three areas: climate change modelling, mitigating climate change, and helping primary producers adapt to inevitable climate changes. NSW DPI has circulated the discussion paper widely and is exploring both internal and external funding for work relating to the priorities it identifies.

Service delivery based on innovative solutions

Help for Indonesia (State Plan: S8)

The Australian Centre for International Agricultural Research has funded NSW DPI to expand our work on restoring soil fertility and cropping in the tsunami affected areas of Aceh and Nias, Indonesia. One new project targets the west coast where damage was greatest and recovery has been slower while another is based in Aceh. NSW DPI has also completed a scoping study for a project to strengthen animal health services. The project specifically concerns controlling serious animal diseases such as anthrax, rabies and avian influenza, which can also spread to humans.

New Cronulla fisheries laboratory (State Plan: E4, E8)

In February the Minister opened a new \$1 million hi-tech research facility at the Cronulla Fisheries Research Centre of Excellence. Named the H C Dannevig Fisheries Laboratory after the Norwegian scientist who founded the original Cronulla laboratory in 1905, the facility supports the Wild Fisheries Program, which studies the biology and status of key commercial and recreational fish and invertebrate species.

Significant issues

Research funding and returns (State Plan: P1, P6)

Returns from investment are estimated to be in the range of 15 to 40 per cent per annum. NSW DPI scientists argue that the current rate of investment should be maintained and point to the healthy return on investment made by the department in the beef, sheep and weeds cooperative research centres.

More information on the evaluation of these investments is at www.dpi.nsw.gov.au/research/branch/health-science/economics-research/reports.

Future directions

Options analysis (State Plan: P1, P6)

We are examining the use of options analysis to supplement the existing framework for investment currently employed in evaluating research funding. Options analysis seeks to value the options that NSW DPI research creates for the community. The approach, which is particularly valuable in industries that must cope with high levels of uncertainty, will enable us to probe, rank and design investments for NSW DPI's extensive research portfolio.

We will continue to evaluate the funding of research through the existing framework for investment, which examines the:

- appropriateness of the issues – addressing questions such as market failure, alignment with corporate goals and state priorities, problem significance, appropriateness and capacity of the agency, and industry priority and support
- efficiency of investment strategies – including likely return on investment and achievement of targeted outcomes at least cost
- effectiveness of research and development approaches, including the likelihood of success, identification of beneficiaries and capacity to extend new knowledge.

Climate change (State Plan: P1, P6, E3, E4)

We will continue to expand research on climate change. Work will centre on the priority areas ratified by the Ministerial Advisory Council on Primary Industries Science – climate change modelling, climate change mitigation, and climate and change adaptation.



The Hon Ian MacDonald MLC (right) with Mr Barry Collier, Member for Miranda opening the new H.C. Dannevig Fisheries Research Laboratory at Cronulla.

Science and Research Divisional performance

	Units	2004-05	2005-06	2006 - 07
Outcomes				
Landholders adopting at least one NSW DPI innovation:				
- sustainability	%	na	na	25
- productivity		na	na	20
Improved mitigation and adaptation to climate change				
- reduction in the net emissions from primary industries sector	%	na	na	2
Major Innovations in pest and disease control to:				
- protect human health		na	na	4
- protect industry	No.	na	na	10
- reduce costs to industry and government	No.	na	na	12
Provision of information to the public:				
- external page views of NSW DPI research website	No.	na	na	190 000
Outputs:				
New diagnostic tests and vaccines	No.	na	na	5
New integrated pest control systems	No.	na	na	6
Provision of formal advice on biosecurity	No.	na	na	50
Scientific and educational publications	No.	804	1 237	1 200
Intellectual property arrangements in place	No.	68	72	70
Samples processed by departmental laboratories	No.	420 000	265 319	350 000
Formal alliances with universities and other research partners	No.	24	31	34

These outcomes and outputs have been recently renegotiated with NSW Treasury and replace previous performance measures; hence the data series does not have values for a number of these outcomes and outputs.

CASE STUDY

“The work with BEST Energies is just one of NSW DPI’s many climate change research projects”

Pyrolysis technology an environmental and award winner

(State Plan: P1, P6, E3, E4)

The results of a research partnership between NSW DPI and BEST Energies grabbed national attention this year for their exciting environmental potential and won the partners the major 2007 World Environment Day Awards category ‘Meeting the Greenhouse Challenge’.*

The partnership, which dates back two years, was established to investigate a renewable energy technology known as pyrolysis that BEST Energies had developed. Pyrolysis involves decomposing green waste or other biomass at high temperatures without oxygen. It generates clean renewable energy plus a stable form of solid carbon called biochar.

Glasshouse and pilot field trials conducted at NSW DPI’s Wollongbar Agricultural Institute have shown that biochar can significantly increase crop biomass production, while improving many soil fertility indicators. Recent work has indicated potential for biochar to reduce soil emissions of greenhouse gases such as nitrous oxide when applied at 10t/ha.

Most importantly for the environment, soils can hold biochar long term, thereby acting as a carbon sink and reducing climate change. The benefits of pyrolysis are such that noted Australian scientist Tim Flannery has listed ‘fostering pyrolysis-based technologies’ in his five steps for saving the planet.

The work with BEST Energies is just one of NSW DPI’s many climate change research projects. Thirty research priorities in three broad categories were approved in 2006-07 by the Ministerial Advisory Council on Primary Industries Science. The categories are:

- developing a predictive capacity to better understand the likely impact of climate change on key primary industries in NSW at a regional scale
- enhancing the ability of primary industry sectors to reduce greenhouse gas emissions
- developing the capacity of primary industries to adapt to inevitable climate change impacts.

For further details see the website at www.dpi.nsw.gov.au/research/climate-change.

* The awards are run annually by the United Nations Association of Australia

BIOSECURITY, COMPLIANCE AND MINE SAFETY DIVISION



Nature and scope of activities

The division develops and implements strategies to protect the NSW economy, environment and public health from the negative impacts of chemical residues, animal and plant pests. We also respond to emergencies and disasters and promote safety in the mining industry.

The division comprises five branches:

- Animal and Plant Biosecurity
- Emergencies, Weeds and Pest Animals
- Agriculture and Fisheries Compliance Operations
- Compliance Standards and Rural Lands Protection Boards Alliance
- Mine Safety Performance

Major outcomes achieved

Risks posed by pests, diseases and chemicals are excluded, eradicated or effectively managed

Market access (State Plan: S8, P6, E4)

During 2005-06 NSW DPI continued to:

- certify a variety of fruit, vegetable, nursery and apiary products to enable those products to be sent to interstate and export markets with quarantine barriers in place. Over 1 800 certificates were issued this year
- audit businesses accredited under schemes that enable producers to self-certify their produce for access to markets where there is a quarantine barrier. Approximately 200 businesses were audited one or more times in 2006-07
- audit NSW saleyards and abattoirs to assess their compliance with NSW and national requirements under the National Livestock Identification System for cattle, sheep and goats. The system underpins strong market access for Australia's meat and livestock industries
- collaborate with the citrus industry in the Riverina to enhance compliance with restrictions on the movement of fruit into the Fruit Fly Exclusion Zone in NSW. Industry funding in 2006-07 enabled the set up of additional vehicle stops and inspections leading to detection of more offenders and increased public awareness
- collaborate with the apiary industry to reduce the incidence and impact of American Foul Brood disease on honey production. Activities this year included a compliance operation in the Young district.

Tick control (State Plan: P6, E4)

After almost 90 years in operation, the Board of Tick Control was replaced by a ministerial advisory committee whose members will be appointed from the beef and dairy industries, rural lands protection boards and NSW Farmers' Association. There will be an independent chair. When establishing the new committee the Minister restated the NSW Government's continued commitment to cattle tick eradication.

During the year NSW DPI and the Rural Crime Unit carried out three operations to check compliance with requirements on stock and horse movements from tick infected areas. The operations centred on Moree, Narrabri, Boggabilla and Tamworth. Further compliance checks were conducted at events such as the Royal Easter Show in Sydney.

Fisheries (State Plan: E4)

Among fisheries compliance activities in 2006-07 were:

- extensive day and night time patrols in coastal and inland waterways
- education in the field and at specific fishing events
- the strategic targeting of high-risk offenders through covert and overt intelligence operations

- the monitoring of aquaculture leases on public water and land for compliance with conditions on use, disease and correct management of chemicals.

As the result of these operations NSW DPI issued 2 352 penalty notices and conducted 359 prosecution outcomes. Of the latter, 327 were successful.

The table below shows compliance across fishery programs.

Fisheries compliance 2006-07 (State Plan: E4)

Program	Total Inspections	Comply %
Aquaculture	1 221	62
Commercial	4 480	91
Conservation	803	na
Recreational	52 178	90

Biosecurity legislation (State Plan: P3)

In the interest of protecting the state's \$8.6 billion agricultural industry, NSW DPI continued to develop, maintain and review legislation underpinning NSW's animal, plant and fisheries biosecurity arrangements. In doing so we ensured that the legislative program was aligned with the regulatory reform agenda set out in the State Plan and met community and industry expectations.

Fruit fly (State Plan: S8, P6)

The majority of the production zones in the fruit fly exclusion zone including Griffith, Leeton and Hillston retained area freedom for fruit flies for 2006-07. A late season outbreak of fruit flies did unfortunately affect some producers in the Narrandera area. Area freedom status for the majority of the area meant, however, that domestic trade and international trade to countries such as the US proceeded without the need for fruit fly treatments.

The audit of NSW DPI's fruit fly program by officials from Indonesia, New Zealand and the Australian Quarantine and Inspection Service indicated that it was meeting requirements. NSW, Victoria and three industry associations also successfully negotiated an agreement for funding the establishment and maintenance of a fruit fly free area in the Sunraysia. If this area can be established as pest-free, local producers will have access to additional markets in Asia.

One-spot livebearers (State Plan: E4)

One-spot livebearers (*Palloceros caudimaculatus*) are a hardy omnivore whose invasive potential has led to their listing as a noxious species in NSW. The Long Reef Golf Course population of livebearers was first recorded in December 1999 following an aquarium release directly into a water hazard. Following an earlier eradication attempt in 2002, NSW DPI treated 10 infested water hazards in 2006 with rotenone delivered via fire tanker. A follow up survey using electro fishing, trapping and

spotlighting in January 2007 confirmed that eradication had been successful.

Bovine Johnes disease (State Plan: S8, P6)

The NSW cattle industry developed and endorsed a new approach to managing Bovine Johnes disease. The three-step process will start with education on the changes to occur and conclude by around 2010 with the removal of Bovine Johnes disease zones in NSW.

Control of footrot (State Plan: S8, P6)

In 2006-07 the Armidale Rural Lands Protection Board submitted an application to become a protected area for footrot. At one stage the board had 135 properties in quarantine for footrot. The number at year's end was 13, which is a testament to success of the footrot disease control program run by NSW DPI and the rural lands protection boards.

Saleyard and swill feeding workshops (State Plan: S8, P7)

We conducted workshops for all inspectors and rangers on a new way of managing inspectorial time in saleyards so that all animal health objectives are met and inspectorial time is effectively used. Another series of workshops concerned the importance of avoiding swill feeding, which is one of the common ways that foot and mouth disease can be spread to animals. Estimates are that a 12-month outbreak of the disease could cost up to \$13 billion.

Pesticide use notification (State Plan: S8 E4)

From February 2007, NSW DPI and other public authorities must notify the community about pesticide use in public places that we own or control. To comply with the new requirements, NSW DPI prepared a Pesticide Use Notification Plan that sets out how, when and where we will notify the general public of any recent or intended pesticide application. A copy of the plan is on our website at: www.dpi.nsw.gov.au/agriculture/farm/chemicals/docs/notification-pesticide-public-places.

Policy development for animal, plant and aquatic industries (State Plan: E4)

NSW DPI develops biosecurity policy across all animal, plant and aquatic industries and also coordinates the NSW government response to Australia's policy development in international trade. In 2006-07 we contributed to a substantial review of the import risk of Cavendish bananas from the Philippines as well as providing comments on draft international plant standards relating to wood packaging and Tephritid fruit flies. Major inputs were made into national preparedness for diseases such as Avian influenza and foot and mouth disease.

Communities and primary industries prepared for managing risks

New methods of destruction and disposal validated

(State Plan: E4)

Disposal of large numbers of infected carcasses during a pest or

disease emergency has long posed significant risks. Traditionally disposal has been by either deep burial or burning. In an Australian first, NSW DPI validated static pile composting and above ground burial as viable alternative methods. Using these methods, emergency managers will be able to minimise the environmental and operational risks associated with carcass disposal. National manuals, policies, procedures and training are being updated to reflect the composting and above ground burial as disposal options.

Moving back a step from disposal, control of a disease such as Avian Influenza will typically necessitate the mass destruction of commercial poultry. This has usually been done by placing each bird in a chamber of carbon dioxide gas – a method that is slow, resource intensive and potentially exposes bird handlers to infection by the disease. A successful NSW DPI trial has now demonstrated that commercial poultry can be killed in their sheds with carbon dioxide. This method reduces the risk of human infection during both destruction and disposal as the poultry can be composted in the shed where they are killed, enhancing the overall biosecurity of the operation.

Training in pest animal control (State Plan: P7, E4)

As the lead state agency in pest animal control, NSW DPI this year offered updated training. Our focus was on best practice and incorporation of the latest research data. Due to the level of demand for training, our registered training organisation at Tocal College, the Invasive Animals Cooperative Research Centre and the University of Canberra formed a partnership to rewrite the current training modules in pest animal control. The modules will potentially reach national and international audiences.

Weed control (State Plan: E4)

Collaboration with stakeholders involved in weed management and support for national initiatives continued during the reporting period.

Significant developments included internal restructuring to create an invasive species policy and planning section, and changes to the Noxious Weeds Advisory Committee to promote more strategically focused stakeholder advice on weed management. The committee is currently considering implementation of a weed risk management system consistent with national protocols.

NSW DPI commenced the Weed Warriors program. The program works with schools to increase awareness and participation in community weed management. Recognising the need for sound information to base weed management decisions on, NSW DPI also updated and distributed over 70 000 weed extension publications and other resources. NSW DPI also published two new weed management guides: *Salvinia Management Guide* and *Integrated Weed Management in Australian Cropping Systems*.

NSW DPI also reared, distributed and established 16 different

weed biological control agents in cooperation with catchment authorities and local government, and collected a cochineal insect in Mexico suitable for control of Hudson Pear.

Implementation of the *Noxious Weeds Act 1993* produced three weed control orders resulting in substantial revisions to weed declarations across NSW. NSW DPI distributed grants totalling nearly \$8 million to support 227 projects. These projects assist public and local weed authorities coordinate and manage noxious weeds.

The mining industry operates to best practice health and safety

Safety performance

Despite two fatalities in the NSW mining industry during 2006-07, the industry maintained the downward trend of the past decade in the fatal injury frequency rate as well as in the lost time injury frequency rate and serious bodily injury/serious injury frequency rate.

The performance statistics in the table below, however, show increases in notifiable incidents and dangerous occurrences in the coal sector in 2006-07, which can be attributed to expanded notification requirements under the *Coal Mine Health and Safety Act 2002* and Coal Mine Health and Safety Regulation 2006. Serious bodily injuries remained constant.

Dangerous incidents decreased, most significantly in the metalliferous sector, while the number of serious injuries in the non-coal sector increased.

Safety performance statistics

	2005-06	2006-07
Fatalities	0	2
Serious bodily injuries (coal)	36	37
Serious injuries (non-coal)	19	26
Notifiable incidents (coal)	273	1 010 ¹
Dangerous occurrences (coal)	22	12
Dangerous incidents (non-coal)	109	82
Lost time injury frequency rate (per million hours worked)	12.5	12.2 ²

¹ Due to new notification requirements of the *Coal Mine Health and Safety Regulation Act 2002* and Coal Mine Health and Safety Regulation 2006

² Estimate based on COMET and Coal Services Pty Ltd data and hours worked in 2005-06.

Mine Safety Advisory Council

The revitalised Mine Safety Advisory Council worked to implement the Wran Mine Safety Review recommendations and the mining industry's response to the NSW Government's 2005 Safety Summit. Implementation of the former was a major focus for the year, with the consultants engaged by the council making progress on examining the impact on health safety of:

- hours of work and fatigue management

- production bonus payments and safety-based incentive schemes
- the apparent disconnect between OHS management systems and workers.

An industry working party comprising representatives from NSW DPI, WorkCover NSW, Coal Services Pty Ltd, and industry and unions is addressing other key Wran Review recommendations on health. Their paper will go to the council which will then make recommendations to the Minister.

The council endorsed and will oversee implementation of the NSW Mining Industry Health and Safety Action Plan to 2008, which outlines how industry will address the priority areas identified at the 2005 summit. These include: manual handling and musculoskeletal disorders, unplanned plant movement, contractor safety and vulnerable workers.

Mine Safety Levy

The Mine Safety Levy, which funds NSW DPI's mine safety regulatory functions, was set at \$17 million for 2007-08 – a decrease of almost \$0.5 million on 2006-07. The levy is based on the wages of employees in the mining and extractive industries and collected through WorkCover NSW and Coal Mines Insurance.

Mine safety legislation (State Plan: P3)

The *Coal Mine Health and Safety Act 2004* and Coal Mine Health and Safety Regulation 2006 were implemented during 2006-07. NSW DPI support for implementation included presentation of industry seminars in major coal mining regions and information distribution.

NSW DPI sought public comment on the extension of the Occupational Health and Safety Regulation 2001 to the entire mining industry and developed drafting instructions for the Mine Health Safety Regulation. The revised regulations should commence in the new financial year.



Occupational health and safety and mechanical engineering were focussed at the NSW DPI safety seminar in August '06

Inquiry into mine safety enforcement

In response to the recommendations of the Wran Review, the NSW Government established a board of inquiry into mine safety enforcement. While the review acknowledged that NSW DPI had made significant progress in enforcement during the past decade, it also uncovered differing stakeholder views on how prosecution and enforcement could best improve mine safety.

The Minister appointed Dr James J Macken AM as the board of inquiry. The terms of reference include establishing:

- the adequacy of the legislative framework
- the role of the NSW DPI Inspectorate
- policy implementation
- the range and application of sanctions.

The board called for public submissions in May 2007 and is due to report in August 2007.

Accident/incident investigation

NSW DPI uses both proactive and reactive measures to improve mine safety. Where death or serious injury occurs, the Investigation Unit conducts detailed investigations that result in recommendations for safety improvement and enable consideration of legal proceedings where warranted. In 2006-07 the Investigation Unit completed seven serious and fatal accident investigations and laid a number of charges relating to previously concluded investigations. The table below shows the performance statistics for this year in comparison to the previous year.

Accident/incident investigation statistics

Performance statistics	2005-06	2006-07
Investigations commenced	5	8
Investigations completed	5	7
Investigations in field stage at the end of year	4	3
Investigation reports submitted to the Coroner	1	1
Coronial inquests commenced	1	0
Prosecutions commenced	11	12
Successful prosecutions	3	7
Unsuccessful prosecutions	0	0

The two fatalities investigated were the death of a contractor from high pressure oil injection and that of a mine worker crushed by a machine.

Mining standards of competence

Following legislative changes, the Coal Competence Board replaced the Coal Mining Qualification Board. Under independent chair John Maitland the board:

- oversees the development of competence standards for

people whose activities may impact on health and safety

- assesses the competence of people working in coal operations
- oversees the examination boards
- advises the Minister on matters related to professional competence.

The principal difference between the former and current regimes is that the Coal Competence Board has greater flexibility in managing competency standards and can introduce new measures over time.

Positive and productive partnerships

Rural lands protection boards (State Plan: S8, E4)

As in previous years, NSW DPI worked closely with rural lands protection boards and producers to reduce the impact of pest animals and monitor for livestock diseases. In the 2006-07 we contributed \$1.6 million to the board system. This was made up of \$740 000 for administration of the State Council of the Rural Lands Protection Boards, \$70 000 for travelling stock reserves, \$60 000 for wild dog control, and over \$750 000 for processing drought claims.

Livestock identification (State Plan: S6, E4)

Management of biosecurity data systems by NSW DPI supports annual livestock exports worth \$4.3 billion. With a view to protecting exports, NSW DPI had previously adopted the National Livestock Identification System (NLIS) and in May 2007 participated with rural lands protection boards in a NLIS exercise to trace cattle in a simulated foot and mouth outbreak. We were also involved in a major collaborative project to develop new property identification code databases and electronic data transfer between the boards, the NSW DPI and the NLIS database.

The NLIS exercise is the subject of a case study in this chapter.

Industry consultation (State Plan: S8, P3, P6)

Consultation with industry was again integral to our work in 2006-07.

For example, in negotiating continuation of the lucrative poinsettia trade to Western Australia, nursery wholesalers assisted NSW DPI in developing protocols to ensure the availability of Christmas supplies of the plant despite the threats posed by virus and pests. Industry consultation was also important to revision of legislation regulating the movement of rice and of grape and sugarcane products into the NSW from pest/disease affected states. The revised proclamations for each of these commodities will ensure ongoing biosecurity while allowing low-risk products greater movement flexibility.

Significant issues

Emergency assistance (State Plan: S8, P6)

Assistance for producers was again important in 2006-07 as

flood following drought. During the year NSW DPI handled over 2 856 calls on the drought hotline, up from 652 in 2005-06, and processed transport subsidies worth more than \$30.5 million for agistment, fodder and water. The number and total value of subsidies were over twice that of the previous year. Rural communities continued to praise the work of our drought support workers in helping producers and their families to deal with the impacts of the drought. Refer to appendix 20 for more details on drought assistance.

NSW DPI responded to 16 emergencies over the year and assisted approximately 170 rural producers. A key element of the bushfires and flood help package was the successful fodder donation scheme, a joint initiative with the NSW Farmers' Association. We also assisted producers affected by eight natural disasters that caused approximately \$8 million worth of damage.

Managing organochlorine residues in the beef industry

(State Plan: P3, P6)

Management of organochlorines left in the soil after pesticide use is a major issue as grazing stock can still pick up residues years. This year NSW DPI worked closely with rural lands protection boards and affected producers to pave the way for new arrangements under a national program. These will see the auditing of management plans for properties which are accredited under the beef industry's Livestock Production Assurance Scheme and have a history of organochlorine

contamination. The arrangements are a further step in the evolution of an industry-based quality assurance for beef in the domestic and export markets and continue the move away from government-based regulatory controls.

Future directions


In 2007-08 the division will:

- develop risk-based NSW DPI and whole-of-government emergency response plans and maintain preparedness for emergencies (State Plan: P6, E4)
- develop and participate in state and national mitigation and response programs for drought, weeds and animal and plant pests and diseases (State Plan: P6, E4)
- support local government stakeholders as NSW DPI facilitates the roll-out of the NSW weed risk management system (State Plan: P6, E4)
- implement the Invasive Species Plan with a range of stakeholders (State Plan: P6, E4)
- implement the Health and Safety Action Plan for the mining industry
- implement the NSW Biosecurity Strategy (State Plan: P6, E4)
- consider the recommendations of the board of inquiry investigating mine safety enforcement.

Biosecurity, Compliance and Mine Safety Divisional performance

	Units	2004-05	2005-06	2006-07
Outcomes:				
Persons accredited in emergency response preparedness	no	193	340	328
Compliance rates for recreational fishers	%	88	89	90
Compliance rates for commercial fishers	%	91	92	91
Compliance rates for aquaculture	%	65	60	62
Outputs:				
Biosecurity plans to which Department has contributed	no	104	227	234
Training programs for emergency response preparedness	no	15	18	32
Biological control agent releases	no	270	270	200
Attendees at workshop seminars relating to health and safety in the mining industry	no	2 400	2 650	2 850
Major investigations (mining)	no	5	4	6
Prosecutions (mining - Investigation Unit reports)	no	3	6	3
Prosecutions (fisheries)	no	460	527	329
Penalty notices (fisheries)	no	2 500	3 000	2 600

CASE STUDY



“The NLIS works through the individual identification of cattle with an electronic tag which can be scanned whenever cattle are moved to a saleyard or between properties”

Implementation of livestock ID confirmed a success (State Plan: P6, E4)

Cowcatcher II held in May 2007 confirmed the successful implementation in NSW of the National Livestock Identification System (NLIS) for cattle – a major initiative designed to underpin market access, consumer confidence and management of disease risks.

In NSW the national Cowcatcher exercise involved tracing 99 independently chosen cattle back to the property of birth plus identifying the tens of thousands of cattle in contact with the 99 and their current location. There were 117 780 in contact cattle spread across 1 800 properties and a number of abattoirs. All cattle were successfully traced within 48 hours.

Audited against the five National Traceability Performance Standards, the exercise demonstrated that the NLIS works well and set a benchmark for the future. It also identified areas for improvement for NSW and the other state and territory participants.

The NLIS works through the individual identification of cattle with an electronic tag which can be scanned whenever cattle are moved to a saleyard or between properties. The tag number, date of movement, and property identification codes are then uploaded to a national database managed by Meat and Livestock Australia. Stock inspectors can use the database to quickly and reliably trace the ‘life history’ of cattle that might be carrying a notifiable disease or have been exposed to a chemical contaminant. Action can then be taken to manage the risk.

The NSW Government encouraged uptake of the system through a \$5.4 million grant which allowed the cost of tags and scanners to be subsidised during the first few years and made extensive advertising and training possible. Additional grants from the Australian Government helped to maintain a 1300 helpline as well as fund audits of saleyards and abattoirs. The audits measured how well the system was working and provided feedback for continual improvement.

Since the NLIS was rolled out to the cattle industry as a whole, more than 8 million NSW cattle have been tagged and more than 9 million transfers recorded on the system database. The rapid implementation of this new technology shows just how effective cooperation between various government and industry sectors can be in delivering benefits for the whole community.

The NLIS roll out is an excellent example of effective across NSW DPI teamwork, and working cooperatively and effectively with the State Council of Rural Lands Protection Boards and Rural Lands Protection Boards.